Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
Implementation of Sections 716 and 717 of	)	CG Docket No. 10-213
the Communications Act of 1934, as Enacted	)	
by the Twenty-First Century Communications	)	
and Video Accessibility Act of 2010	)	

PN COMMENTS OF CTIA – ACCESSIBILITY OF COMMUNICATIONS TECHNOLOGIES

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PN COMMENTS OF CTIA –
ACCESSIBILITY OF COMMUNICATIONS TECHNOLOGIES

CTIA[1/] is pleased to submit these comments in response to the Public Notice issued by the Consumer and Governmental Affairs Bureau ("Bureau") of the Federal Communications Commission ("Commission" or "FCC") seeking comment to inform the Commission's preparation of the 2016 biennial report[2/] required by the Twenty-First Century Communications and Video Accessibility Act of 2010 ("CVAA" or the "Act").[3/]

[1/] CTIA® (www.ctia.org) represents the U.S. wireless communications industry. With members from wireless carriers and their suppliers to providers and manufacturers of wireless data services and products, the association brings together a dynamic group of companies that enable consumers to lead a 21st century connected life. CTIA members benefit from its vigorous advocacy at all levels of government for policies that foster the continued innovation, investment and economic impact of America's competitive and world-leading mobile ecosystem. The association also coordinates the industry's voluntary best practices and initiatives and convenes the industry's leading wireless tradeshow. CTIA was founded in 1984 and is based in Washington, D.C.

[2/] *See Consumer and Governmental Affairs Bureau Seeks Comment on the Accessibility of Communications Technologies for the 2016 Biennial Report Required By the Twenty-First Century Communications and Video Accessibility Act*, Public Notice, CG Docket No. 10-213, DA 16-575 (rel. May 23, 2016) ("Public Notice"). CTIA notes that the original published due date for stakeholders to submit comments in response to the Public Notice was June 22, 2016. However, sometime around June 1, the Public Notice available in the Commission's Electronic Comment Filing System ("ECFS"), without notice, indicated a revised due date. Despite this, the related "Date Comment Period" on ECFS's Detailed Filing Information continues to display the original due date of June 22, 2016. Because the Commission made no public statement pertaining to this change, CTIA files these comments by the original date.

[3/] Twenty-First Century Communications and Video Accessibility Act, Pub. L. No. 111-260 (2010) (codified in various section of 47 U.S.C.); 47 U.S.C. §618(b)(1).

INTRODUCTION AND SUMMARY

As CTIA describes herein, the U.S. wireless industry continues to be a major contributor to the advancements in technology that provide accessible and usable advanced communications services and equipment for people with disabilities, consistent with the letter, spirit, and intent of the CVAA. Indeed, as Chairman Wheeler recently stated, "[w]e can use today's technologies to address so many of the communications barriers facing Americans with disabilities."[4/] The availability of accessible wireless products and services has been integral to providing consumers with disabilities access to today's economic, educational, and social opportunities. As Commissioner Mignon Clyburn recently noted, "[o]ver the past decade, advancements in technology have helped to dramatically change the lives of people living with disabilities. These innovative products and services have broken down barriers that in the past made it difficult for those with unique needs to communicate socially, academically, and professionally, on par with their peers."[5/]

The wireless industry has helped break down these communications barriers for individuals with disabilities and has taken voluntary collaborative measures to contribute to the widespread availability of, and information about, accessible wireless products and services. Additionally, the U.S. wireless industry continues to offer all consumers – including people with disabilities – an array of innovative and competitive wireless services and devices. And since 2014, wireless service providers have invested more than $64 billion in their networks. This massive capital investment spurs investment and innovation throughout the wireless ecosystem

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[4/] *See* FCC Press Release, Chairman Wheeler Honors Innovators in Accessibility Communications Technology (June 13, 2016), http://transition.fcc.gov/Daily_Releases/Daily_Business/2016/db0613/DOC-339781A1.pdf.

[5/] Remarks of Commissioner Mignon L. Clyburn, Disability Advisory Committee (June 16, 2016), http://transition.fcc.gov/Daily_Releases/Daily_Business/2016/db0616/DOC-339863A1.pdf.

promoting the development of, among other things, services, devices, and applications ("apps") that are accessible to individuals with disabilities.

Six years after the CVAA was adopted, the wireless industry has fully responded to Congress's call to incorporate accessibility into product development processes and offers a wide variety of accessible wireless devices, services, and apps at a range of price points. Further, the development of 5G technologies and the Internet of Things ("IoT") will provide all consumers – including those with disabilities – with even more options that will impact health, mobility, and education.

CTIA and its member companies also have engaged in numerous collaborative and outreach efforts with the accessibility community that have yielded positive policy outcomes, including a commitment to Text-to-911, the pending Real-Time Text ("RTT") rulemaking, and the November 2015 Hearing Aid Compatibility ("HAC") Consensus Proposal. CTIA also continues to lead effective outreach strategies to ensure that consumers have easy and quick access to information about the accessible wireless products and services available to them and how to use them, and can more easily interact with customer service.

The wireless industry's significant efforts and outreach have been widely recognized and commended, including through recognition from the accessibility community. Last year, for example, both Sprint and AT&T scored a perfect 100 on the United States Business Leadership Network's Disability Equality Index survey, which recognizes a company's accessibility activities in the workplace, supply chain, and marketplace.[6/] Furthermore, in the last quarter of 2014, Sprint won a Title IV Public Service Award from the New York City Mayor's Office for

[6/] *Disability Equality Index (DEI)*, USBLN, http://www.usbln.org/programs-dei.html (last visited June 22, 2016).

People with Disabilities for New York Relay Service.[7/] Microsoft has also been widely recognized for its contributions to the accessibility community.[8/] And in 2015, Odin Mobile was given an Access Award from AFB for its accessible devices and affordable voice, text, and data plans.[9/]

CTIA urges the Commission to consider a "light touch" regulatory framework when evaluating regulations for this growing and innovative market. A flexible regulatory approach, tailored to allow for innovation and experimentation, has resulted in better wireless offerings for all, including the innovation of wireless products and services that meet the needs of individuals with disabilities. Even more, national policies that enable the availability of more spectrum and expedited infrastructure deployment for the wireless industry are necessary to ensure continued investment and innovation. Finally, in order to facilitate the rapid resolution of legitimate accessibility concerns, CTIA encourages the Commission to address concerns pertaining to the Request for Dispute Assistance ("RDA") process, so that consumers and the wireless industry have a clear understanding of the process and can work together with a common goal of more accessible products and services.

[7/] *Sprint Newsroom, Awards*, Sprint, http://newsroom.sprint.com/Awards/Company/ (last visited June 22, 2016).

[8/] Press Release, Microsoft to be Honored for Commitment to Accessibility for People with Autism and other Developmental Disabilities (Apr. 22, 2015, 12:38), http://www.prnewswire.com/news-releases/microsoft-to-be-honored-for-commitment-to-accessibility-for-people-with-autism-and-other-developmental-disabilities-300070345.html; Save the Date – The Washington Autism Alliance & Advocacy's WAAALL of Impact Luncheon, http://www.washingtonautismadvocacy.org/updates/2015/08/31/save-the-date-waaa-luncheon/.

[9/] Press Release, American Foundation for the Blind Announces 2015 Access Award Winners (Feb. 4 2015), http://www.afb.org/info/about-us/press-room/press-release-archive/afb-announces-2015-access-award-winners/1245.

I. THE U.S. WIRELESS INDUSTRY CONTINUES TO LEAD IN OFFERING ACCESSIBLE SERVICES AND EQUIPMENT.

The provision of accessible wireless services and equipment has become commonplace in the years since the CVAA passed. As a result of its years-long commitment to accessibility, the wireless industry has incorporated accessibility into various stages of service offerings, as well as into product design and deployment. In the last two years, wireless providers and manufacturers have continued to develop innovative services and products that benefit all consumers, including individuals with disabilities.[10/] Additionally, the emergence of platform-based technologies has given all consumers the ability to have a ***consistent*** wireless experience across services, plans, and devices, while allowing the ability to ***customize*** wireless devices and plan features to suit their needs – an ability particularly important for people of all different abilities. Manufacturers of wireless devices have also enabled and encouraged the development of a variety of innovative third-party applications, which have emerged to work with wireless products and services, enhancing accessibility even further. The future for accessible wireless products and services is bright, and the Internet of Things and 5G will provide even greater mobile wireless accessibility options for consumers, including people with disabilities.

A. Wireless Service Providers Increasingly Offer A Wide Array Of Accessible Services And Plans.

Wireless service providers continue to update and expand the array of services that are accessible to people with disabilities and seniors, including voice, text, and data services, providing wireless customers with numerous service plan options to meet a variety of specific

[10/] The numerous examples provided throughout these comments are not exhaustive, but rather a representation of the wireless industry's ongoing efforts and commitment to making wireless services and products accessible to all consumers.

communications needs. AT&T, for example, offers a number of plans for smartphones[11/] and basic and feature phones[12/] that are specifically designed for accessibility needs. Sprint's Relay Data Plan is tailored to consumers that are deaf or hard of hearing by providing data-only plans with unlimited Internet access, text and picture messaging, and email, while also blocking voice calls on certain devices.[13/] T-Mobile's Simple Choice Data Only Plans[14/] provide users with unlimited data and messaging services, which benefits users that do not need voice services. Verizon's Nationwide Messaging Plans with unlimited text, picture, or video messaging are designed for individuals who cannot utilize voice minutes to communicate.[15/] U.S. Cellular offers two messaging-only plans designed specifically for the deaf and hard of hearing.[16/]

In addition to specific accessibility offerings, HD Voice technologies have emerged to enhance wireless voice call services for all consumers, but specifically improving call clarity for people with hearing loss. HD Voice, which is currently offered by AT&T, Sprint, T-Mobile, and Verizon, enables consumers to have clearer phone conversations with enhanced call quality and

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[11/] *Smartphone Accessibility Plans*, AT&T, https://www.att.com/shopcms/media/att/2016/shop/wireless/landing/disability-aging/pdf/PDF-Smartphone-accessibility-plans.pdf.

[12/] *Basic and Feature Phone Accessibility Plans*, AT&T, https://www.att.com/shopcms/media/att/2016/shop/wireless/landing/disability-aging/pdf/PDF-Basic-and-feature-phone-accessibility-plans.pdf. Each basic and feature phone plan offers unlimited data.

[13/] *Sprint Relay Store*, Sprint, http://www.sprintrelay.com/services/sprint-relay-store (last visited June 22, 2016).

[14/] *See Accessibility Policy*, T-Mobile, http://www.t-mobile.com/company/company-info/consumer/accessibility-policy.html (last visited June 22, 2016).

[15/] *See Nationwide Messaging Plans*, Verizon, https://www.verizonwireless.com/aboutus/accessibility/nationwidemessaging.html (last visited June 22, 2016).

[16/] *Messaging-Only Plans*, U.S. Cellular, https://www.uscellular.com/plans/text-only.html (last visited June 22, 2016).

reduced background noise.[17/] HD Voice services are specifically helpful for people with hearing loss by enabling consumers to better distinguish confusing sounds, decipher words that have close sounds, and reduce listening effort and listener fatigue.[18/] A number of wireless handsets available today at a variety of price points can support HD Voice, including offerings from Samsung, HTC, Apple, LG, Microsoft, Motorola, Kyocera, and Blackberry.[19/]

Persons who have difficulty holding a device to their ear for extended periods of time, or who use sign language to communicate, benefit from the improvements that wireless providers have made to video calling. Video communications, while still nascent, allow users to communicate in real-time with a visual interface through a wireless device without having to download or configure an additional application.[20/]

Wireless service providers offer plans at a range of prices, and also offer a variety of post- and pre-paid plans to accommodate differing abilities to pay. As CTIA explained to the Commission recently, service providers are offering increased flexibility in their plan offerings, shared data plans, and plans with data rollover policies in order to provide additional pricing

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[17/] *See HD Voice*, AT&T, https://www.att.com/shop/wireless/features/hd-voice.html (last visited June 22, 2016); *HD Voice*, *FAQs About HD Voice From Sprint*, Sprint, https://support.sprint.com/support/article/FAQs_about_HD_Voice_from_Sprint/3b348589-81a4-452d-8758-cd47d7ddb952 (last visited June 22, 2016); *HD Voice*, T-Mobile, https://support.t-mobile.com/docs/DOC-5407 (last visited June 22, 2016); *HD Voice*, Verizon, http://www.verizonwireless.com/solutions-and-services/hd-voice/ (last visited June 22, 2016).

[18/] *See*, *e.g.*, *HD Voice*, T-Mobile, https://support.t-mobile.com/docs/DOC-5407 (last visited June 22, 2016).

[19/] *See*, *e.g.*, *Smartphones*, *HD Voice*, Verizon, https://www.verizonwireless.com/smartphones/hd-voice/ (last visited June 22, 2016); *Smartphones*, *HD Voice*, AT&T, https://www.att.com/shop/wireless/devices/smartphones.html?taxoFeatures=HD-Voice (last visited June 22, 2016).

[20/] *See AT&T Video Call*, AT&T, https://www.att.com/shop/wireless/features/video-calling.html (last visited June 22, 2016); *see also* Press Release, T-Mobile, Announcing T-Mobile Video Calling (Sept. 3, 2015), https://newsroom.t-mobile.com/news-and-blogs/video-calling.htm (explaining that "Video Calling works right out-of-the-box from your smartphone's dialer" and that "Video Calling couldn't be simpler to use. Place and receive calls as you normally would—simply choose either the video call button or voice call button").

options for consumers.[21/] SouthernLINC offers a Prepaid Unlimited Monthly plan that includes unlimited regional data and picture messaging.[22/] Additionally, in 2015, Republic Wireless introduced plans that refund customers for pre-purchased unused data,[23/] giving consumers the flexibility to use the data that is needed and not be charged for data that is not used.[24/] Lastly, U.S. Cellular has four pre-paid plans under $60 that include unlimited text messaging, including three plans with unlimited voice.[25/]

Wireless providers are continuing to compete and innovate to meet consumers' needs for mobile wireless data services, particularly people with disabilities who utilize data-intensive services, including video calling, video streaming, and location-based services. For example, T-Mobile offers the Simple Choice Plan, through which a customer can chose the amount of 4G LTE data that he or she needs, including an unlimited data option.[26/] Sprint also offers a plan with unlimited voice, text, and data, so that heavy users of data need not worry about data limits.[27/] SouthernLINC Wireless's SimpleLINC Unlimited plan offers unlimited regional data and messaging.[28/]

[21/] *See* Comments of CTIA, WT Docket No. 16-137, at 31-33 (filed May 31, 2016) ("CTIA Wireless Competition Comments").

[22/] *Prepaid Plans*, SouthernLINC, https://www.southernlinc.com/service-plans/prepaid/prepaid-unlimited-monthly.aspx (last visited June 22, 2016).

[23/] *Affordable Phone Plans that Pay You Back*, Republic Wireless, https://republicwireless.com/plans/ (last visited June 22, 2016).

[24/] *Id*.

[25/] *Plans*, U.S. Cellular, https://www.uscellular.com/uscellular/plans/showPlans.jsp?plan-selector-type=prepaid&type=plans#listing (last visited June 22, 2016).

[26/] *Simple Choice Plan*, T-Mobile, http://www.t-mobile.com/cell-phone-plans.html (last visited June 22, 2016).

[27/] *FAQ About the Sprint Unlimited Plans*, Sprint, https://support.sprint.com/support/article/FAQs_about_the_Sprint_Unlimited_Plans/e8bc59f3-1893-4482-895a-38b7ed69ab65#faq2 (last updated May 12, 2016).

[28/] *Service Plans*, SouthernLINC, https://www.southernlinc.com/service-plans/simplelinc/1-year.aspx (last visited June 22, 2016).

More recently, free data offerings give consumers the benefits of using more data, without having to pay more, which has the potential to significantly benefit people with disabilities that may rely on data-intensive video streaming applications. T-Mobile offers free data services such as Music Freedom or Binge-On, which allow subscribers to enjoy music or video without it counting against the data allowance[29/] – a valuable asset to those with unusually high data needs. Verizon's go90 similarly offers a wide array of video content that customers can watch without a deduction from their data allotment.[30/] And AT&T's Sponsored Data service enables companies to sponsor the data usage for specific content so that customers can browse or stream the content without it impacting their monthly data plan allowance.[31/] Given the potential benefits of free data services for all consumers, including people with disabilities, the Commission should reject efforts to restrict the availability of these services and options.

B. Wireless Equipment Manufacturers Continue To Develop Innovative Devices And Software That Include A Variety Of Accessible Features And Solutions.

Wireless equipment manufacturers are committed to developing and offering wireless devices that are accessible to all consumers. Since the adoption of the CVAA, they have worked to incorporate features into wireless devices that enable communications accessibility for consumers with low- or no-vision, who are deaf or hard of hearing, and who have dexterity or cognitive issues. Manufacturers also offer a number of consumer resources to ensure that people with disabilities are aware of and can use accessible wireless devices.

[29/] *See Release the Beat. Set the Music Free*, T-Mobile, www.t-mobile.com/offer/free-music-streaming (last visited June 22, 2016); *Introducing Binge On*, T-Mobile, http://www.t-mobile.com/offer/binge-on-streaming-video.html (last visited June 22, 2016).

[30/] *See* Go90, Verizon, http://www.verizonwireless.com/landingpages/go90/ (last visited June 22, 2016).

[31/] *See Sponsored Data*, AT&T, http://www.att.com/att/sponsoreddata/en/index.html#tab2 (last visited June 22, 2016).

1. Manufacturers continue to innovate by offering devices with numerous accessibility features and enhancements.

Technological innovation in the wireless industry since 2014 has meant that, like all consumers, people with disabilities have a wide variety of constantly growing device options. Manufacturers continue to improve smartphone and basic phone accessibility features and solutions to meet the needs of people with a variety of disabilities. These devices and technologies are also increasingly available for purchase in stores or online. Moreover, because the wireless industry has largely converged on a platform-based approach through, for example, Apple's iOS, Google's Android and Microsoft's Windows platforms, accessibility features are generally available across a wide range of devices. This gives each consumer consistency throughout the devices they use, while allowing customization for the features they want.[32/]

Vision-related features. Wireless device manufacturers continue to offer a variety of vision-related features to meet the needs of individuals who are blind or visually-impaired. For example, Apple's Voice Over screen reader provides the user with an audio description of everything that is happening onscreen and how to navigate it.[33/] The Odin VI mobile phone is specifically designed and intended for use by people who are blind or low vision – it reads aloud everything that is on the screen and the buttons that are pressed, speaks the caller ID and battery charge, and is available in English, Spanish, French, and other European languages.[34/] The

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[32/] Apple's Accessibility Webpage, for example, explains how the accessibility features it offers work the same way on all of its products and apps. *Accessibility*, Apple, http://www.apple.com/accessibility/ (last visited June 22, 2016).

[33/] *Accessibility: Voice Over for OS X*, Apple, http://www.apple.com/accessibility/osx/voiceover/ (last visited June 22, 2016).

[34/] *Odin Vi*, Odin Mobile, http://odinmobile.com/phones/odin-vi/ (last visited June 22, 2016). The American Foundation for the Blind's Access World Magazine reviewed the Odin VI phone in January 2015 and praised the phone as "without a doubt the most accessible feature phone." *See* Bill Holton, *A Review of the Odin VI: An Accessible Feature Phone from Odin Mobile*, AFB ACCESSWORLD MAG. (Jan. 2015), https://www.afb.org/afbpress/pub.asp?DocID=aw160103.

Braille-support features that are available on devices that operate through Google's Android and Apple's iOS can also assist individuals who are blind by connecting wireless Braille displays and can navigate a device using voice technologies.[35/] LG's Talkback function assists people with impaired vision by providing verbal feedback.[36/] An individual who is visually impaired may also use the voice input feature on HTC's One (M8) smartphone to speak text into a particular field instead of typing it.[37/] Microsoft has enhanced its screen reader and keyboard/touch navigation technology so that users with vision impairments can access data and send messages across wireless devices, including smartphones and computers.[38/] And, Blackberry's magnify and reverse contrast features allow those that are visually impaired to zoom-in on information, including information in apps that do not normally support zooming, and to adjust the contrast display on Blackberry phones.[39/]

Hearing-related features. Wireless device manufacturers also continue to develop and offer features that meet the needs of individuals who are deaf or hard of hearing. Hearing-related

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[35/] *Install and Enable BrailleBack*, Google, https://support.google.com/accessibility/android/answer/3535226?hl=en (last visited June 22, 2016) (explaining that BrailleBack allows consumers to "connect a refreshable braille display to your Android device via Bluetooth. BrailleBack works with the TalkBack screen reader service to provide a combined speech and braille experience"); *Braille Displays for iOS*, Apple, http://www.apple.com/accessibility/ios/braille-display.html (last visited June 22, 2016) (explaining that the "iPad, iPhone (3GS or later), and iPod touch (3rd generation or later) support more than 50 Bluetooth wireless braille displays right out of the box. Simply pair one and start using it to navigate your iOS device with VoiceOver — no additional software needed").

[36/] *See Accessibility*, LG, http://www.lg.com/us/mobile-phones/VS985/Userguide/444.html (last visited June 22, 2016).

[37/] *See HTC One (M8)*, HTC, http://www.htc.com/us/support/htc-one-m8/howto/464908.html (last visited June 22, 2016).

[38/] *Accessibility in Office 365 – Progress in 2015 and Plans for 2016*, Office 365 (Feb. 22, 2016), https://blogs.office.com/2016/02/22/accessibility-in-office-365-progress-in-2015-and-plans-for-2016/.

[39/] *Turn on the Reverse Contrast Feature*, Blackberry, https://help.blackberry.com/en/blackberry-z3/10.3.2/help/mar1413395102778.html (last visited June 22, 2016); *Turn on Magnify Mode*, Blackberry, https://help.blackberry.com/en/blackberry-z3/10.3.2/help/mes1334345051199.html (last visited June 22, 2016).

features on wireless devices allow the user to receive an alert (*e.g.*, a visual or tactile signal) for calls, messages, and other notifications. For example, an individual who is deaf or hard-of-hearing can take advantage of Samsung's Sound Balance, Flash Notification, Adapt Sound, and Mono Audio features to create a unique sound experience suitable to his or her individual needs.[40/] Samsung also offers individuals with severe hearing disabilities the ability to create vibration patterns to replace ringtones in order to receive an incoming call notification.[41/] Blackberry users can use the Natural Sound feature[42/] to improve sound quality from the phone's speakers, which translates to a pair of headphones. Motorola's Crystal Talk technology is helpful for individuals suffering from varying forms of hearing loss, because it includes vocal amplification, background noise filtering, and articulation enhancement.[43/] HTC offers individuals with various hearing disabilities a range of accessibility features, including hearing aid compatibility, Sidetone (providing immediate, low-level audio feedback of the user's own voice during a phone call), closed captions, LED notification (providing a visual notification or vibration for notifications including phone calls), and mono/stereo sound (allowing a user to toggle sound input between mono and stereo sound).[44/] In the newer category of mobile wireless wearable technologies, Apple's Watch includes Taptic Engine, a feature that enables the watch

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[40/] *Accessibility*, Samsung, http://www.samsung.com/uk/mobileaccessibility/ (last visited June 22, 2016).

[41/] *Id*.

[42/] Tyler Lee, *BlackBerry Demonstrates Natural Sound Technology on YouTube*, UBERGIZMO (Nov. 11, 2013), http://www.ubergizmo.com/2013/11/blackberry-demonstrates-natural-sound-technology-on-youtube/ .

[43/] *What is CrystalTalk*, Motorola Mobility, LLC, https://motorola-global-portal.custhelp.com/app/answers/detail/a_id/36026/related/1 (last visited June 22, 2016).

[44/] *Accessibility*, HTC, https://www.htc.com/us/Accessibility/ (last visited June 22, 2016) (explaining that HTC strives to continually "improve the accessibility of our devices for individuals with disabilities, including individuals who are deaf, hard of hearing, blind, or visually impaired").

to produce haptic feedback so that the user feels a gentle tap on the wrist for each new notification.[45/]

Dexterity-related features. Wireless manufacturers also continue to develop and offer innovative features to meet the needs of individuals with physical and dexterity impairments, including features such as external hardware support and voice commands. Switch Access by Android provides a touch-screen alternative for individuals with mobility-related impairments to control the device.[46/] Similarly, HTC devices that support Sense Home provide users with a context-sensitive menu of apps based on the user's location, which reduces the difficulty of searching through multiple screens to find a device function or app.[47/] Consumers with dexterity-related disabilities can also use the voice input feature on HTC's One (M8) smartphone to speak text instead of typing it[48/] or unlock an LG device using Knock Code by tapping a pattern on the phone screen to unlock the phone without pushing any additional buttons or unlock gestures.[49/] Blackberry has also developed a single-hand and hands-free operation option that assists individuals with dexterity disabilities, and Word Substitution replaces specific text with preloaded text to simplify typing and minimize the number of keystrokes required to write messages and voice notes.[50/]

[45/] *Accessibility*, Apple, http://www.apple.com/accessibility/ (last visited June 22, 2016).

[46/] *About Switch Access for Android*, Google, https://support.google.com/accessibility/android/answer/6122836?hl=en (last visited June 22, 2016).

[47/] *What is the HTC Sense Home Widget*, HTC, http://www.htc.com/mea-en/support/htc-one-m9/howto/601556.html (last visited June 22, 2016).

[48/] *See HTC One (M8)*, HTC, http://www.htc.com/us/support/htc-one-m8/howto/464908.html (last visited June 22, 2016).

[49/] *Introducing LG Knock Code ™*, LG, http://www.lg.com/us/mobile-phones/knockcode (last visited June 22, 2016).

[50/] *See Accessibility*, Blackberry, http://us.blackberry.com/legal/accessibility.html (last visited June 22, 2016).

Cognition-related features. Wireless devices are becoming increasingly more useful for individuals with cognitive and learning disabilities. For example, wireless device manufacturers continue to develop and offer innovative features to simplify functions and help a user stay focused. Apple's Guided Access feature enables users to temporarily restrict an Apple device to a single app, disable areas of the screen that are not relevant to a task to limit distraction, and disable certain hardware buttons.[51/] Similarly, Samsung offers an "Easy Mode" on certain devices that configures the user's home screen to provide larger icons and a simpler layout to help eliminate distractions, enable personalization, and facilitate usage for first-time smartphone users.[52/] Users can also turn to Blackberry's devices supporting Voice Notes to record, save, and share voice note reminders.[53/] Windows devices supporting Microsoft's OneNote[54/] assist users with cognitive disabilities to sustain attention while the device is in focus mode and to improve word recognition with the device's syllabification tool.

Personal assistant and other accessibility features. Mobile "personal assistant" features are increasingly common on smartphones and other devices. These features continue to add ease to everyday tasks and operations for all consumers, including individuals with disabilities. Apple's Speak Screen and Siri,[55/] Microsoft's Cortana,[56/] BlackBerry's Assistant,[57/] and Google

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[51/] *Use Guided Access with iPhone, iPad, and iPod touch*, Apple, https://support.apple.com/en-us/HT202612 (last visited June 22, 2016).

[52/] *See, e.g.*, *Galaxy Note 5 – How do I enable Easy Mode on my Samsung Galaxy Note 5?*, Samsung, http://www.samsung.com/ca/support/skp/faq/1099434 (last visited June 22, 2016).

[53/] *Accessibility*, Blackberry, http://us.blackberry.com/legal/accessibility.html (last visited June 22, 2016).

[54/] *Learning Tools for OneNote Learning Improves Learning For All*, OFFICEBLOGS (Jan. 19, 2016) https://blogs.office.com/2016/01/19/learning-tools-for-onenote-improves-learning-for-all/.

[55/] *Use Siri on Your iPhone, iPad, or iPod Touch*, Apple, https://support.apple.com/en-us/HT204389 (last visited June 22, 2016); *iOS. A Wide Range of Features for a Wide Range of Needs*, http://www.apple.com/accessibility/ios/ (last visited June 22, 2016).

[56/] *Cortana in More Places*, Microsoft, https://www.microsoft.com/en-us/mobile/experiences/cortana/ (last visited June 22, 2016).

Now are a few examples of mobile personal assistants that can respond to voice commands, send messages, place calls, and set reminders for the user.

2. Manufacturers continue to make information available to consumers on how to find and purchase accessible devices.

It is also increasingly easier for persons with disabilities to find and purchase accessible devices that will meet their particular needs. Accessible devices are available in the same stores, on the same websites, and are available in the same time frames as any other consumer wireless devices available in the market. An individual with a disability can go into a store or kiosk that sells wireless devices and obtain the device they need, or go online for even more options.[58/] Individuals can also use CTIA's AccessWireless.org website to easily locate devices through the Global Accessibility Reporting Initiative ("GARI") database.[59/]

In addition, accessible devices and equipment are available with a range of low-end and high-end features and functions, at a variety of price points. For individuals seeking lower-cost phones with accessibility features, the Kyocera Verve is a feature phone that supports voice dialing, Bluetooth technology, and features a built-in screen reader and a slide out, tactile QWERTY keyboard.[60/] Individuals with dexterity and vision disabilities can use Samsung's Convoy 3, a feature phone that includes voice-command technology to place a call, send a

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[57/] *About the Blackberry Assistant*, Blackberry, http://help.blackberry.com/en/blackberry-leap/10.3.1/help/amc1403813518716.html (last visited June 22, 2016).

[58/] *See, e.g.*, *Jitterbug Smart*, Greatcall, https://www.greatcall.com/phones/jitterbug-smart-smartphone-for-seniors# (last visited June 22, 2016) (available for purchase online with free shipping and options to find a store that carries the phone); *Apple*, http://www.apple.com/ (last visited June 22, 2016) (all Apple devices are available online or at Apple retail stores located nationwide); *Odin Mobile*, http://odinmobile.com/ (last visited June 22, 2016) (offering phones for sale online).

[59/] *GARI*, AccessWireless, http://www.accesswireless.org/Find/Gari.aspx (last visited June 22, 2016).

[60/] *Verve*, Kyocera, https://www.kyoceramobile.com/verve/ (last visited June 22, 2016).

message, send a picture, or look up a contact.[61/] LG's A341 is another feature phone that touts simple accessible features, including a large display screen, Text-to-Speech technology that allows the user to listen to texts as they are read aloud, and a "Senior Mode" for enhanced audio quality.[62/]

For persons with disabilities that want a smartphone with all the bells and whistles, there are a large number of options. Apple offers its iPhone 6 series that includes the accessible features discussed above, including video calling and Siri; the iPhone 6 Plus and 6S Plus feature a larger display screen.[63/] The Doro 824 SmartEasy smartphone was developed specifically for senior adults and includes a 5-inch display screen, larger tiles for texting, and remote access for other individuals to help the user complete a number of tasks, including entering contacts.[64/] The Jitterbug Smart by GreatCall – which continues to focus on products for senior adults and individuals with disabilities – is a large smartphone that supports Personal Operator, a personal assistant service, and voice typing, which converts speech into on-screen texts.[65/] Furthermore, individuals with limited dexterity can control the input functions on a Sesame Enable smartphone through head gestures and voice prompts, rather than by swiping or tapping. The Sesame Enable smartphones are also the first hands-free smartphones in the world.[66/]

[61/] *Samsung Convoy 3*, Samsung, http://www.samsung.com/us/mobile/cell-phones/SCH-U680MAAVZW (last visited June 22, 2016).

[62/] *LG A3431*, LG, http://www.lg.com/ca_en/cell-phones/lg-A341 (last visited June 22, 2016).

[63/] *Compare iPhone Models*, Apple, http://www.apple.com/iphone/compare/ (last visited June 22, 2016).

[64/] *Doro 824 SmartEasy*, Consumer Cellular, https://www.consumercellular.com/Info/PhoneDetails/689 (last visited June 22, 2016).

[65/] *Jitterbug Smart*, Greatcall, https://www.greatcall.com/docs/default-source/pdfs/jitterbug-smart-leads-brochure.pdf.

[66/] *Sesame Enable*, https://sesame-enable.com/ (last visited June 22, 2016).

C. A Diverse Wireless Application Ecosystem Is Enhancing Accessibility.

The proliferation of wireless apps has also offered an additional means of enhancing accessibility of wireless services and devices. An increasing number of service providers and manufacturers are creating and offering apps that enhance the accessibility of wireless devices, as well as assist disabled individuals with day-to-day activities. The wireless industry also continues to create resources for the development of apps by third parties.

1. Wireless service providers and manufacturers offer applications and information to enhance the accessibility of their products and services.

In 2008, there were over 225,000 apps being offered by non-carrier application stores.[67/] The amount of apps that have been developed, purchased, and downloaded has increased exponentially in the past eight years, with more than 5.7 million apps currently being offered by the five leading app stores alone (Amazon, BlackBerry World, Google Play, Apple's App Store, and the Windows Store).[68/] A variety of applications, from both service providers and manufacturers, have emerged to make products and services even more accessible. For instance, individuals who are deaf or hard-of-hearing can use Sprint's Mobile IP App to make and receive IP Relay calls.[69/] Wireless providers also offer navigation services that assist the accessibility community; T-Mobile and Sprint, for example, currently offer Telenav – a personal navigator that provides voice-guided, turn-by-turn directions – on certain devices.[70/] Visually-impaired

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[67/] *Mobile Application Stores*, Vision Mobile, http://www.visionmobile.com/wp-content/uploads/2008/11/mas-solutions.gif (last visited June 22, 2016).

[68/] *Number of apps available in leading app stores as of June 2016*, Statista, http://www.statista.com/statistics/276623/number-of-apps-available-in-leading-app-stores/ (last visited June 22, 2016).

[69/] *Sprint Mobile IP App*, Sprint, http://www.sprintrelay.com/services/sprint-mobile-ip-app (last visited June 22, 2016).

[70/] *TelNav App*, T-Mobile, https://support.t-mobile.com/docs/DOC-4533 (last visited June 22, 2016); *GPS Navigation*, Sprint,

individuals can use Verizon's VelaSense to obtain feedback about objects and surroundings; the app provides the user with the tools to recognize text, colors, currency, and barcodes.[71/] AT&T's Navigator allows users to use voice-input to identify their destination and hear directions and traffic warnings from the device.[72/] Microsoft also plans to make all of its Office 365 apps for Windows 10 devices accessible to individuals with visual impairments so they can view and edit content easily.[73/]

In addition, the wireless industry offers resources for third-party app developers to utilize, in an effort to further compatibility with built-in accessibility features. An increasing number of manufacturers, for example, provide resources via online guides to make third-party app developers aware of the needs of people with disabilities, such as Apple's Accessibility for Developers,[74/] Android's guide on making applications accessible,[75/] BlackBerry's guide on creating accessible apps,[76/] and Google's web and Android accessibility testing tools.[77/] In

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http://shop.sprint.com/mysprint/services_solutions/details.jsp?detId=gps_navigation&catId=service_gps&catName=GPS&detName=GPS%20Navigation (last visited June 22, 2016).

[71/] *Accessibility*, *VelaSense*, Verizon, https://www.verizonwireless.com/aboutus/accessibility/velasense.html (last visited June 22, 2016).

[72/] *AT&T Navigator*, AT&T, https://www.att.com/shop/apps/navigator.html (last visited June 22, 2016).

[73/] *Accessibility in Office 365 – Progress in 2015 and Plans for 2016*, OFFICE 365 BLOG (Feb. 22, 2016), https://blogs.office.com/2016/02/22/accessibility-in-office-365-progress-in-2015-and-plans-for-2016/

[74/] *Accessibility for Developers*, Apple, https://developer.apple.com/accessibility/ (last visited June 22, 2016).

[75/] *Making Applications Accessible*, Android, https://developer.android.com/guide/topics/ui/accessibility/apps.html (last visited June 22, 2016).

[76/] *See Creating Accessible Apps*, Blackberry, https://developer.blackberry.com/native/documentation/best_practices/accessibility/creating_accessible_apps.html (last visited June 22, 2016).

[77/] *Resources for Developers and Publishers*, Google, https://www.google.com/accessibility/for-developers.html (last visited June 22, 2016).

addition, Apple also showcased new accessibility features for iOS at the 2016 Apple Worldwide Developers Conference.[78/]

2. Third-party application developers have developed innovative apps that work with wireless products and services to meet the needs of individuals with disabilities.

A variety of apps offered by third parties enhance the accessibility of wireless devices and assist individuals with disabilities with daily functions and tasks.

Hearing-Related Apps. CSDVRS LLC offers the Z5 Mobile app for individuals who are deaf and hard of hearing to make point-to-point video calls from any Apple mobile device to any phone with a video camera.[79/] The CapTel apps generate nearly simultaneous online captions during phone conversations.[80/] The TapTap app alerts users that are deaf or hard-of-hearing when a loud noise has been made near them or if someone is speaking in the user's vicinity.[81/] Deaf individuals can use the Sorenson Buzzcards app to communicate with individuals who do not know sign language by typing a message and showing it to the person with whom the user is communicating.[82/] Messages can be saved as virtual flashcards and used later. Lastly, the RogerVoice app allows a user that is deaf or hearing-impaired to read captions on phone calls.[83/]

Vision-Related and Navigation Apps. Individuals who are blind or visually-impaired can use VizWiz on Apple devices to receive quick answers to questions pertaining to the user's

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[78/] *Apple Accessibility Program Guide for iOS*, Apple, https://developer.apple.com/library/prerelease/content/documentation/UserExperience/Conceptual/iPhoneAccessibility/Introduction/Introduction.html (last visited June 22, 2016).

[79/] Z5 Mobile, Apple iTunes, https://itunes.apple.com/us/app/z5-mobile/id415488663?mt=8 (last visited June 22, 2016).

[80/] *Apps for People With Hearing Loss*, CapTel (Jan. 23, 2014), http://www.captel.com/news/speech-to-text-and-captioning/apps-people-hearing-loss.

[81/] *TapTap App for Deaf*, http://www.taptap.biz/ (last visited June 22, 2016).

[82/] *Sorenson BuzzCards*, Apple iTunes, https://itunes.apple.com/us/app/sorenson-buzzcards/id380582593?mt=8 (last visited June 22, 2016).

[83/] *Roger Voice*, https://rogervoice.com/ (last visited June 22, 2016).

surroundings.[84/] Similarly, Dragon Dictation allows a user to dictate a text message or email, as well as create social media status updates.[85/] Additionally, beacon technologies allow mobile apps running on either iOS (using iBeacon) or Android devices to deliver hyper-contextual, highly-targeted content to users who are blind and visually-impaired to understand an exact location in a store and obtain information about various products, such as prices, locations, and ingredients.[86/] The KNFB Reader is a screen reader app that assists individuals who are blind by reading aloud print documents using the camera on a smartphone and optical character recognition technology. [87/] Disney recently released its Movies Anywhere app for Apple devices so that users who are blind or visually-impaired can receive an audio description of certain Disney films.[88/] The HumanWare Communicator app establishes a text conversation between a deaf-blind user and a sighted user with a refreshable Braille display. The sighted user will receive a visual message on the screen of the device and the non-sighted user will receive a message in Braille if connected to external Braille equipment.[89/] Blind individuals can also use the LookAround[90/] or BlindSquare[91/] applications to receive announcements on the nearest points

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[84/] *VizWiz*, http://www.vizwiz.org/ (last visited June 22, 2016).

[85/] *Dragon Dictation*, Nuance, http://www.nuance.com/for-individuals/mobile-applications/dragon-dictation/index.htm (last visited June 22, 2016).

[86/] *What is iBeacon?*, iBeaconInsider, http://www.ibeacon.com/what-is-ibeacon-a-guide-to-beacons/ (last visited June 22, 2016); *Google Beacons*, Google, https://developers.google.com/beacons/ (last visited June 22, 2016); *iBeacon for Developers*, Apple, https://developer.apple.com/ibeacon/ (last visited June 22, 2016).

[87/] *KNFB Reader*, http://www.knfbreader.com/ (last visited June 22, 2016).

[88/] *Disney Movies Anywhere App: Synced Audio Description for Pixar Movies*, AccessWireless (June 8, 2016), http://www.accesswireless.org/about-us/news/16-06-08/Disney_Movies_Anywhere_App_Synced_Audio_Description_for_Pixar_Movies.aspx.

[89/] *Human Ware Communicator*, HumanWare, http://www.humanware.com/en-usa/products/deafblind_communication_solutions/humanware_communicator (last visited June 22, 2016).

[90/] *Sendero GPS LookAround*, Sendero Group, http://www.senderogroup.com/products/shopiphone.htm (last visited June 22, 2016).

of interest, street intersections, and the user's current location. Individuals with disabilities and their caregivers can receive more information about such apps and products through websites such as AppleVis, which is a community-powered website that provides information for blind and low-vision users of Apple products.[92/]

Cognitive and Dexterity-Related Apps. DyslexiaKey makes the font in each application on a phone have a heavy base line and each character have a distinct difference to make reading and writing easier for individuals affected by dyslexia.[93/] Individuals with cognitive impairments can use the SOS QR app to send an emergency notification to a pre-populated list of contacts who, in addition to receiving a call or message, receive a map with the user's location.[94/] Likewise, the UnusTactus app simplifies smartphone access for users with cognitive disabilities by permitting a one-touch photo dialer button and an alert notification to a list of contacts if the user leaves a pre-defined area.[95/] Individuals with motor, speech, and language impairments can use the Talkitt app to translate unintelligible pronunciation into understandable speech by allowing the user to communicate using his or her voice.[96/] Lastly, the Access Earth app serves a similar function as "Trip Advisor" for individuals with mobility impairments by allowing them to rate the accessibility of restaurants, hotels, and tourist attractions around the world.[97/]

[91/] *What is BlindSquare*, BlindSquare, http://blindsquare.com/about/ (last visited June 22, 2016) (explaining that BlindSquare "is self-voicing, announcing points of interest, intersections and user-defined points through a dedicated speech synthesizer").

[92/] *AppleVis*, http://www.applevis.com/ (last visited June 22, 2016).

[93/] *DyslexiaKey*, Apple iTunes, https://itunes.apple.com/app/dyslexiakey-dyslexic-keyboard/id957626910?ign-mpt=uo%3D8 (last visited June 22, 2016).

[94/] *SOS QR*, http://www.sos-qr.com/ (last visited June 22, 2016).

[95/] *UnusTactus*, http://www.unustactus.com/ (last visited June 22, 2016).

[96/] *Talkitt*, http://www.talkitt.com/ (last visited June 22, 2016).

[97/] *New App Will Serve As 'TripAdvisor' For People With Disabilities*, AccessWireless (May 12, 2016), http://www.accesswireless.org/about-us/news/16-05-12/New_App_Will_Serve_As_TripAdvisor_For_People_With_Disabilities.aspx.

Other Accessibility Apps. In addition to apps that enhance the user's ability to effectively use wireless devices, several third parties have developed apps that help individuals with disabilities communicate with other individuals during daily face-to-face interactions and that make the world more accessible to individuals with disabilities. For example, senior adults can take advantage of the 5Star Service app offered by Jitterbug, which connects the user with an agent 24/7 to provide the user with location information and 9-1-1 support.[98/]

Blogs and websites also continue to provide application suggestions for various disability constituencies. OT's with Apps & Technology is a blog that reviews apps and technologies for occupational therapists working with children and adults,[99/] and the North Carolina Department of Health and Human Services also provides a list of apps that enhance accessibility of mobile devices for users who are deaf, hard of hearing, deaf-blind, or speech-impaired.[100/]

D. The Internet Of Things And 5G Will Provide Even Greater Accessibility Options for Wireless Consumers.

The IoT ecosystem combined with 5G technologies are poised to provide more connectivity and allow people with disabilities to utilize the technologies and services with lower-latency (delays in network responses), faster speeds, and higher-capacity,[101/] which is particularly beneficial for video streaming and video communications services. According to

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[98/] *GreatCall*, https://www.greatcall.com/services-apps (last visited June 22, 2016) (displaying the services and apps available for the Jitterbug and Greatcall phones and devices).

[99/] *OT's with Apps & Technology*, https://otswithapps.com/ (last visited June 22, 2016).

[100/] *Assistive Technology for the Deaf and Hard of Hearing*, North Carolina Department of Health and Human Services, http://www.ncdhhs.gov/assistance/ hearing-loss/assistive-technology-for-the-deaf-and-hard-of-hearing (last visited June 22, 2016).

[101/] *See* Thomas K. Sawanobori, *The Next Generation of Wireless: 5G Leadership in the U.S.*, CTIA (Feb. 9, 2016), http://www.ctia.org/docs/default-source/default-document-library/5g_white-paper-web.pdf ("*CTIA 5G Leadership Whitepaper*"); Thomas K. Sawanobori and Paul V. Anuszkiewicz, *High Band Spectrum: The Key to Unlocking the Next Generation of Wireless*, CTIA (June 13, 2016), http://www.ctia.org/docs/default-source/default-document-library/5g-high-band-white-paper.pdf.

Gartner, IoT will grow to encompass 21 billion devices and be a $3 trillion-a-year industry by 2020,[102/] while Cisco goes even further to estimate a $8 trillion, 50-billion-device market in that same timeframe.[103/] 5G technologies will support these IoT services by facilitating the connection of nearly everything, resulting in fully connected lives. Therefore, IoT innovation and 5G technologies will result in a pervasive wireless environment by providing more wireless options for individuals with disabilities across industries.

Health. The wireless telehealth industry is rapidly evolving, enabling health providers to remotely monitor patients, as well as provide real-time health information and support, which has translated into observable outcomes, including improved clinical outcomes and improved access to providers.[104/] Telehealth innovation has resulted in the development of sensors – wireless equipment placed on or near a patient to wirelessly transmit data – to enhance patient care. There are numerous types of sensors that are being deployed, including external sensors that connect to the body, blood-sampling and tissue-embedded sensors to monitor respiration, heart rate, and glucose levels, or wearables that are embedded into clothing or accessories.[105/]

[102/] Press Release, Gartner, Gartner Says 6.4 Billion Connected "Things" Will Be in Use in 2016, Up 30 Percent From 2015 (Nov. 10, 2015), http://www.gartner.com/newsroom/id/3165317.

[103/] Press Release, Cisco, Internet of Things Will Deliver $1.9 Trillion Boost to Supply Chain and Logistics Operations (Apr. 15, 2015), https://newsroom.cisco.com/press-release-content?articleId=1621819.

[104/] *See, e.g.*, Eric Wicklund, *mHealth Study: Remote Monitoring Cuts Costs, Hospitalizations*, MHEALTH INTELLIGENCE (June 15, 2016), http://mhealthintelligence.com/news/mhealth-study-remote-monitoring-cuts-costs-hospitalizations; *The Mobile Healthcare (mHealth) Bible: 2015-2020 – Analysis of the $13 Billion Market Featuring 750+ Vendors*, PR NEWSWIRE (Apr. 2, 2015), http://www.prnewswire.com/news-releases/the-mobile-healthcare-mhealth-bible-2015---2020---analysis-of-the-13-billion-market-featuring-750-vendors-300061917.html; Karen Wagner, *How Mobile Health Is Changing Care Delivery*, HFMA (Nov. 4, 2014), http://www.hfma.org/leadership/mobilehealth/.

[105/] CHF, MAKING SENSE OF SENSORS: HOW NEW TECHNOLOGIES CAN CHANGE PATIENT CARE 5 (Feb. 2013), *available at* http://www.chcf.org/~/media/MEDIA%20LIBRARY%20Files/PDF/PDF%20M/PDF%20MakingSenseSensors.pdf; *see also CTIA 5G Leadership Whitepaper* (finding that "sensors for health monitoring are going to be more prevalent" and will "improve safety, health, and efficiency").

For example, sensors can be placed on wheelchairs connected to certain smartphone applications to monitor a patient and provide notifications to the healthcare provider pertaining to the user's movements or lack thereof.[106/] Wearable sensors are also assisting individuals with disabilities to communicate with others and to obtain assistance remotely from healthcare providers. Currently, individuals who are blind or deaf can use the dbGLOVE, a wearable glove that digitizes touch-based alphabets, like Braille, to use all features of their wireless devices and to communicate with others.[107/] Microsoft's 3D Soundscape Technology, supported by Windows phones, will assist the visually-impaired by providing audio cues through a headset.[108/] In addition to sensors, virtual reality products are also assisting the disabled community. For example, the Oculus Rift headset, traditionally used for video gaming,[109/] has been used to treat patients with glaucoma, to ease pain in burn victims, and to evaluate patients with post-traumatic stress disorder.[110/]

Mobility. IoT and emerging 5G technologies also have implications for mobility and transportation.[111/] With respect to automobiles, vehicle broadband access will provide a driver

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[106/] Laura Sydell, *For People With Disabilities, New Technology Can be Life Changing*, NPR (May 21, 2016, 1:46 PM), http://www.npr.org/sections/alltechconsidered/2016/05/21/478925944/for-people-with-disabilities-new-technology-can-be-life-changing?utm_campaign=storyshare&utm_source=twitter.com&utm_medium=social.

[107/] *About dbGlove*, dbGlove, http://www.dbglove.com/pages/en/about (last visited June 22, 2016).

[108/] *Microsoft's 3D Soundscape Technology Research Helps Visually Impaired* (Nov. 14, 2014), https://blogs.windows.com/devices/2014/11/14/microsoft-research-3d-soundscape-technology-helps-visually-impaired/.

[109/] *See Rift Next-Generation Virtual Reality*, Oculus, https://www.oculus.com/en-us/rift/ (last visited June 22, 2016).

[110/] Yasmeen Abutaleb, *Beyond Games, Oculus Virtual Reality Headset Finds Medical Uses*, Reuters (June 10, 2015, 9:03 PM), http://www.reuters.com/article/us-oculus-medicine-idUSKBN0OR02620150611.

[111/] *The Internet of Things*, US DOT (2015), http://www.rita.dot.gov/publications/technology_scan/internet.

with a number of alerts and notifications that go beyond the "check engine" light[112/] and automated vehicles will provide a source of mobility for disabled individuals.[113/] The National Highway Traffic Safety Administration ("NHTSA") has encouraged automated vehicle innovators and manufacturers to meet with and work with the blind and other disabled communities to develop technologies to improve automotive mobility.[114/] Consistent with NHTSA's efforts, the Toyota Motor Company has expressed an interest in increasing access to vehicles to senior and disabled adults.[115/]

IoT innovation will also assist with the development of wireless communications systems on public transit networks. For example, a recent study was conducted to reduce the difficulties that commuters who are blind or visually-impaired have in accessing public transit information.[116/] An interactive communications system was tested in which a user transmits information to a bus, which then provides a notification to the driver that someone is waiting to board on the bus. The success rate of the system, recognizing the arrival of the bus and the individual boarding the correct bus, reached 100 percent in all of the tests.[117/]

Additionally, AfterShokz manufactures bone conduction headphones that use vibrations to send sounds to the user's inner ear so no outside noise is removed, providing assistance to

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[112/] *See CTIA 5G Leadership Whitepaper*.

[113/] *Older, Disabled Drivers Pose Challenge for Driverless Car Makers*, BNA (May 6, 2016), http://www.bna.com/older-disabled-drivers-n57982070757/.

[114/] *Id.*

[115/] *Id.*

[116/] Hsia-Lan Wang, Ya-Ping Chen, Chi-Lun Rau, & Chung-Huang Yu, *An Interactive Wireless Communication System for Visually Impaired People Using City Bus Transport*, NCBI (Apr. 25, 2014), http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4053904/.

[117/] *Id.*

blind or deaf-blind users when crossing streets.[118/] Toyota is in the process of developing a shoulder-mounted wearable device so that individuals who are blind or visually impaired can survey surroundings and better navigate them.[119/] With respect to augmented reality tools, augmented reality apps are using the cameras on mobile devices to create real-time views of a user's surroundings and incorporate information from digital sources, like navigation aids and maps, so that users with cognitive disabilities can gain a better understanding of where they are going.[120/] As 5G technologies and IoT connectivity evolves, mobility equipment will continue to be developed to assist the accessibility community.

Education. 5G technology also has the potential to dramatically advance consumer experiences, including consumers with disabilities, with respect to education.[121/] New technologies will make curriculum and educational tools even more accessible and available in a manner that meets the unique learning styles of all students. Currently, students with visual impairments, hearing impairments, and new language learners, can utilize Dragon Naturally Speaking and IBM's ViaVoice speech-to-text software, which allow students to dictate written assignments.[122/] Similarly, Smartpen by Livescribe creates a real-time digital transcription of

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[118/] *Accessibility FAQs*, AfterShokz, http://aftershokz.com/pages/accessibility-faqs (last visited June 22, 2016).

[119/] *Toyota Project BLAID Wearable Set to Help Blind and Visually Impaired People*, Toyota (Mar. 7, 2016), http://blog.toyota.co.uk/toyota-project-blaid-blind-visually-impaired-people.

[120/] Don D. McMahon *et al.*, *Effects of Digital Navigation Aids on Adults with Intellectual Disabilities: Comparison of Paper Map, Google Maps, and Augmented Reality*, J. OF SPECIAL ED. TECH. Vol. 3, (2015), http://jst.sagepub.com/content/30/3/157.full.pdf+html. Microsoft's Cities Unlocked in the UK, offers a comparable solution to deter mobility challenged faced by individuals with disabilities. *See* http://www.citiesunlocked.org.uk/.

[121/] *See CTIA 5G Leadership Whitepaper*.

[122/] Mobile Future, Mobile Ability, The transformational Impact of Wireless Innovation for People with Disabilities at 17. (2010), http://mobilefuture.org/wp-content/uploads/2013/02/mobile-future.publications.Mobile-Ability.pdf.

notes that also recites the lesson back to the student.[123/] For students with physical impairments, HeadMouse gives students greater control over standard computers and keyboards by navigating an on-screen cursor with movements of the student's head.[124/]

II. THE WIRELESS INDUSTRY CONTINUES TO UNDERTAKE OUTREACH AND EDUCATION ACTIVITIES TO ENGAGE WITH AND INFORM THE ACCESSIBILITY COMMUNITY.

In the last two years, the wireless industry has continued to step up its efforts to engage the accessibility community in an ongoing dialogue to ensure that wireless service providers and manufacturers understand the needs of the accessibility community. This outreach and engagement at all stages of the implementation and deployment processes is consistent with the broader goal of the CVAA to ensure that all Americans have access to communications technologies. As Commissioner Jessica Rosenworcel stated, "[b]y bringing everyone to the table, we have kick started a conversation about accessibility in new technologies by design. If we keep this discussion going, we can do a lot more to extend opportunity and access in the digital age. Because instead of playing an endless game of catch-up, we can have accessibility and innovation walk together hand in hand."[125/] Consistent with this engagement, CTIA and its members also continue to lead effective outreach strategies to ensure that consumers have easy and quick access to information about the accessible wireless products and services available to them and how to use them.

[123/] *Id.*

[124/] *Id.*

[125/] *See* Remarks of Commissioner Jessica L. Rosenworcel, W3C20 Anniversary Symposium: The Future of the Web, Santa Clara, California (Oct. 29, 2014), https://apps.fcc.gov/edocs_public/attachmatch/DOC-330237A1.pdf.

A. Wireless Service Providers And Manufacturers Regularly Consult With The Accessibility Community As An Integral Part Of Designing And Testing Accessible Solutions.

Service providers are able to improve their service offerings by regularly consulting with people with disabilities during product planning, service development, and testing. AT&T's Corporate Accessibility Technology Office ("CATO"), for example, ensures that its products and services meet the needs of its customers with disabilities by assessing the accessibility implications of new projects.[126/] Similarly, manufacturers are also working with people with disabilities during product planning, service development, and testing in order to address the needs and interests of the disability community and find adequate solutions. For example, Microsoft recently partnered with the American Council of the Blind to advance accessibility and enable planned updates for Microsoft's products to meet the needs of individuals who are blind or visually-impaired.[127/] Further, AT&T worked with New York University to hold the Connect Ability Challenge that matched developers with individuals with disabilities to facilitate the development of cost-efficient and accessible smartphones, wearables, and other wireless devices.[128/]

B. The Wireless Industry Continues To Prioritize Engaging Consumer Representatives In An Ongoing Dialogue About Accessibility.

CTIA and its members engage in regular outreach and communications with the accessibility community to ensure that both industry and consumers have an opportunity to

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[126/] *See, e.g.*, G3ICT, AT&T'S CORPORATE ACCESSIBILITY TECHNOLOGY OFFICE: AN INDUSTRY MODEL (2013), http://about.att.com/content/dam/csr/11_21Assests/ATT%20CATO%20White%20Paper.pdf.

[127/] Press Release, Microsoft, Microsoft, American Council of the Blind Partner to Advance Accessibility (Dec. 17, 2015), http://news.microsoft.com/2015/12/17/microsoft-american-council-of-the-blind-partner-to-advance-accessibility/.

[128/] Press Release, AT&T, AT&T, NYU Announce Winners of $100,000 Connect Ability Challenge to Improve the Lives of People Living with Disabilities (July 27, 2015), http://about.att.com/story/att_nyu_announce_winners_of_tech_challenge.html

express their challenges and understand each others' needs. By providing conferences, seminars, workshops, and other programs, the wireless industry works to ensure that there is ample opportunity to exchange views with the accessibility community on the state of accessible communications.

In 2014 and 2015, CTIA participated in nearly 30 accessibility-related events, including panels, sponsorships, conference, summits, webinars and more. These events included Super Mobility,[129/] CTIA's annual wireless conference that includes accessibility discussions; the Hearing Loss Association of America ("HLAA") convention,[130/] an annual convention that focuses on the latest technology for people with hearing loss; the Biennial Telecommunications for the Deaf and Hard of Hearing ("TDI") Conference,[131/] a conference that brings government officials, wireless industry representatives, and consumers together to discuss accessible telecommunications; and the M-Enabling Summit,[132/] a program dedicated to promoting mobile accessible and assistive applications.

CTIA members – providers and manufacturers alike – also actively engage with representatives of the accessibility community to promote mobile accessibility, through meetings, workshops, and conferences. For example, AT&T has assembled the AT&T Advisory Panel on Access & Aging ("AAPAA"), composed of representatives from organizations that support the accessibility community, such as TDI, the National Council on Independent Living, and the American Foundation for the Blind ("AFB"), to advise AT&T employees on aging and disability issues. The AAPAA meets semiannually with AT&T leadership to provide ongoing

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[129/] *CTIA Super Mobility 2016*, http://www.ctiasupermobility2016.com/ (last visited June 22, 2016).

[130/] *HLAA 2016 Convention*, http://www.hearingloss.org/content/convention (last visited June 22, 2016).

[131/] *2015 Biennial TDI Conference*, https://tdiforaccess.org/about-tdi/biennial-conference/2015-biennial-tdi-conference-baltimore-md/ (last visited June 22, 2016).

[132/] *M-Enabling Summit 2016*, http://www.m-enabling.com/conreg.html (last visited June 22, 2016).

input on accessibility efforts.[133/] And AT&T's employee resource group, oxyGEN, provided educational workshops for seniors throughout 2014.[134/]

Google has a Teaching Accessibility working group, which collaborates with various wireless industry representatives to integrate accessible learning into Computer Science curriculums at colleges and universities.[135/] Furthermore, Google's Impact Challenge works with various nonprofits and the accessibility community to raise awareness of solutions that will increase access and opportunities for disabled individuals.[136/] Microsoft Philanthropies, a new Microsoft subset, [137/] invests in digital inclusion programs.[138/] T-Mobile's Accessibility Council also facilitates valuable information exchanges between external industry experts and company representatives regarding accessible product and service enhancements and opportunities, and the company participates with the other nationwide wireless carriers in conferences and seminars on accessibility in telecommunications.

[133/] *AT&T Advisory Panel of Access & Aging*, http://www.wireless.att.com/learn/articles-resources/disability-resources/advisory-panel.jsp (last visited June 22, 2016).

[134/] *The AT&T Issue Brief Library, Accessibility*, AT&T, http://about.att.com/content/csr/home/issue-brief-builder/technology/accessibility.html (last visited June 22, 2016).

[135/] *Initiatives and Research*, Google Accessibility, https://www.google.com/accessibility/initiatives-research.html (last visited June 22, 2016).

[136/] *Google Impact Challenge*, Google, https://www.google.org/impactchallenge/disabilities/ (last visited June 22, 2016).

[137/] Brad Smith, *Microsoft Depends Longstanding Commitment to Philanthropy with Expanded Vision, New Organization*, MICROSOFT BLOG (Dec. 15, 2015), http://blogs.microsoft.com/blog/2015/12/15/microsoft-deepens-longstanding-commitment-to-philanthropy-with-expanded-vision-new-organization/.

[138/] *Id.*

C. CTIA And The Wireless Industry Work To Ensure That Persons With Disabilities Have Access To The Latest Information About What Accessible Products And Services Exist And How To Use Them.

CTIA and its members also continue to provide a constant flow of information to the accessibility community about the choices they have for accessible products and services and how to use them.

Through AccessWireless.org ("AccessWireless"), CTIA, provides the "first stop" for people with disabilities to obtain information about accessible wireless products and services.[139/] AccessWireless is most commonly used as a resource for seniors to find a phone and to obtain information about wireless device accessibility features. News articles are updated daily to provide the accessibility community with the latest information on communications technology and accessibility.

According to CTIA's 2016 metrics, the "Find a Phone" page on AccessWireless is visited more often than any other page on the site, including the homepage. Other main pages and sub-pages such as "Resources for Seniors," "Newsroom," and "Guides and How Tos," are among the top ten most frequently visited pages on AccessWireless. The GARI page, which matches disabled individuals with a wireless device with features that best meet the needs of the individual, is AccessWireless' third most popular page. AccessWireless also provides links to the webpages of its member service providers and equipment manufacturers.

Nationwide and regional carriers alike – including Sprint,[140/] Verizon,[141/] AT&T,[142/] U.S. Cellular,[143/] and T-Mobile,[144/] – offer accessibility pages on their websites that describe and

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[139/] *See* CTIA, AccessWireless, http://www.accesswireless.org/Home.aspx (last visited June 22, 2016).

[140/] *Our commitment to people with disabilities*, Sprint, https://www.sprint.com/landings/accessibility/ (last visited June 22, 2016).

[141/] *Accessibility Products & Services Overview*, Verizon, https://www.verizonwireless.com/aboutus/accessibility/ (last visited June 22, 2016).

explain their respective accessible wireless offerings. In fact, AT&T recently launched a new website, developed in collaboration with Common Sense Media, called *AT&T Digital You*, to provide even more helpful resources for persons with disabilities.[145/] Bluegrass Cellular modified its website to improve a number of functions in order to assist individuals that are located in remote locations and have difficulty traveling to Bluegrass stores. Bluegrass Cellular has begun releasing Internet radio advertisements describing its offerings, in an attempt to ensure that individuals with visual impairments have access to the latest information about its offerings.[146/]

Manufacturers like Samsung,[147/] HTC,[148/] LG,[149/] and Apple,[150/] likewise ensure that their websites reflect information detailing the variety of accessible features and functions of their wireless devices. Indeed, HTC recently overhauled its accessibility webpage by adding additional useful accessibility information and making the website more user friendly.[151/]

[142/] *AT&T accessibility resources*, AT&T, https://www.att.com/shop/wireless/mobile-accessibility.html (last visited June 22, 2016).

[143/] *Hearing Aid Compatibility & Accessibility*, U.S. Cellular, https://www.uscellular.com/uscellular/services/hearing-aid.jsp (last visited June 22, 2016).

[144/] *About Us*, T-Mobile, http://www.t-mobile.com/company/company-info/consumer/accessibility-policy.html (last visited June 22, 2016).

[145/] *Accessibility Resources*, AT&T, https://www.att.com/shop/wireless/mobile-accessibility.html (last visited June 22, 2016); *AT&T Digital You*, AT&T, http://digitalyou.att.com/users-with-disabilities/ (last visited June 22, 2016).

[146/] *See generally* Bluegrass Cellular, https://bluegrasscellular.com/ (last visited June 22, 2016).

[147/] *Mobile Accessibility: Technology Accessible to Everyone*, Samsung, http://www.samsung.com/latin_en/mobileaccessibility/ (last visited June 22, 2016).

[148/] *Accessibility*, HTC, http://www.htc.com/us/Accessibility/ (last visited June 22, 2016).

[149/] *Mobile Accessibility*, LG, http://www.lg.com/global/sustainability/customer/accessibility/mobile (last visited June 22, 2016).

[150/] *Accessibility*, Apple, http://www.apple.com/accessibility/ (last visited June 22, 2016).

[151/] *Accessibility*, HTC, http://www.htc.com/us/Accessibility/ (last visited June 22, 2016).

Wireless providers and manufactures also provide instructional information about how to use the accessible products and services they offer. For example, Odin Mobile offers an instructional podcast on the features of, and how to operate, the Odin VI phone.[152/] Verizon has detailed instructions on its website that provide guidelines to setting up accessible features on the mobile phones it offers.[153/] AT&T holds Wireless Independence Now ("WIN") Workshops to teach individuals with disabilities how to use the accessibility features on its smartphones and devices,[154/] and AT&T's CATO recently collaborated with the Rehabilitative Engineering Research Center for Wireless Technologies to conduct outreach efforts to educate the accessibility community on the accessibility features of wireless devices.[155/] Bluegrass Cellular has an extensive outreach program that includes traveling to its customers and assisting disabled individuals with mobile device setup. Further, Sprint's Direct 2 You program delivers phones to a customer – whether at home, work, or a coffee shop – and provides in-person support on how to set up the new device free of charge.[156/]

Moreover, the wireless industry continues to promote accessibility by facilitating internal training programs so that employees can identify suitable products to offer individuals with disabilities. T-Mobile, for example, provides accessibility training and resources to its employees to allow them to better assist customers with specific needs that come into T-Mobile

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[152/] *Instructional Podcasts for Odin VI*, OdinMobile, http://odinmobile.com/odin-vi-tutorials/ (last visited June 22, 2016).

[153/] *Accessibility*, Verizon, https://www.verizonwireless.com/aboutus/accessibility/index.html (last visited June 22, 2016).

[154/] *See* Kendra Ragsdale, *Connecting People with Disabilities to Their World Through Technology*, 3BL MEDIA (May 24, 2016, 1:20PM), https://3blmedia.com/News/Connecting-People-Disabilities-Their-World-Through-Technology.

[155/] Wireless Rehabilitation Engineering Research Center, http://www.wirelessrerc.org/ (last visited June 22, 2016).

[156/] Press Release, Sprint Expands Direct 2 You From Coast to Coast (Oct. 13, 2015), http://newsroom.sprint.com/presskits/direct-2-you-press-kit.htm.

retail stores. Verizon's National Accessibility Customer Service Center is staffed with specially-trained personnel that can offer communications solutions to individuals with disabilities and provide troubleshooting, product support, and various accessibility solutions to customers with disabilities.[157/]

Microsoft offers an American Sign Language ("ASL") Answer Desk,[158/] through which individuals who are deaf or hard of hearing can connect with a Microsoft representative that communicates through ASL as his or her primary language to obtain product assistance. Similarly, through Sprint's Relay Video Customer Service, customers can contact a representative who uses ASL to obtain technical and billing assistance.[159/] And since 2014, Bluegrass has established a chatting system that allows hearing-impaired individuals to have a personal connection with a customer service representative to assist in reviewing products and plans that meet the specific needs of that individual.

III. ACCESSIBILITY COMMUNITY AND WIRELESS INDUSTRY COLLABORATION AND ENGAGEMENT HAVE YIELDED KEY POLICY AND AWARENESS OUTCOMES.

Consistent with the letter, spirit, and intent of the CVAA, the wireless industry's ongoing collaboration with the accessibility community has yielded key policy and awareness outcomes. These achievements demonstrate that a cooperative approach to accessibility policy can yield positive outcomes that reflect joint consumer and industry perspectives about how to best advance key accessible communications and public safety policy goals. Recent such efforts that

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[157/] Press Release, Verizon Unveils New National Accessibility Customer Service Center (Oct. 23, 2014), https://www.verizon.com/about/news/verizon-unveils-new-national-accessibility-customer-service-center.

[158/] Daniel Hubbell, *Working Towards a More Accessible World: ASL Answer Desk*, MICROSOFT ACCESSIBILITY BLOG (Aug. 21, 2015), http://blogs.msdn.com/b/accessibility/archive/2015/08/21/working-towards-a-more-accessible-world-asl-answer-desk.aspx.

[159/] *Video Customer Service (VCS)*, Sprint, https://www.sprint.com/landings/accessibility/hearing_video.html (last visited June 22, 2016).

have yielded positive policy outcomes or have such potential include a commitment to Text-to-911, the pending RTT rulemaking, and the November 2015 HAC Consensus Proposal. CTIA urges the Commission to recognize the value of these negotiated outcomes such as these as it considers regulations.

Text-to-911/9-1-1 Location Accuracy. The safety and security of people with disabilities is an equally shared priority for the wireless industry and representatives of the accessibility community. Through collaboration and engagement on the FCC's Emergency Access Advisory Committee ("EAAC"), which Congress directed the FCC to form under the CVAA, consensus was developed among consumers and industry to support Text-to-911 as an interim solution between the underutilized wireless teletypewriter ("TTY") and still promising Next Generation 9-1-1 services. Text-to-911 offers consumers who are deaf, hard of hearing, speech impaired, or for other reasons incapable of making a voice call (*e.g.*, domestic abuse or active shooter situations) to directly communicate with Public Safety Answering Points through SMS-based text messages. Since 2014, all wireless carriers have expended substantial resources and deployed capabilities to support Text-to-911 services nationwide. Today, more than 600 PSAPs across 30 states have elected to receive Text-to-911.

In June 2015, CTIA, along with a broad cross-section of industry stakeholders and partners, announced the formation of an Advisory Group to provide guidance on implementation of wireless carriers' implementation of key elements of the FCC's *Wireless 9-1-1 Location Accuracy Fourth Report & Order*.[160/] HLAA, AFB, and TDI are actively participating in CTIA's 9-1-1 Location Accuracy Advisory Group to ensure that people with disabilities have a

[160/] Press Release, CTIA, CTIA Announces Key Progress Toward Enhanced 9-1-1 Location Accuracy (June 5, 2015), http://www.ctia.org/resource-library/press-releases/archive/ctia-announces-key-progress-toward-enhanced-9-1-1-location-accuracy.

voice in the process. CTIA has been working with the FCC, the public safety community, people with disabilities, state and local governments, and various other stakeholders on improving the location accuracy of wireless 9-1-1 calls.

Real-Time Text. As deaf, hard of hearing, and speech-impaired consumers overwhelmingly adopt innovative wireless services, CTIA believes it is time for the Commission to move beyond the antiquated wireless TTY requirements imposed on new wireless networks and products. As Commissioner Michael O'Rielly stated, wireless TTY is an "outdated system" that "has been largely abandoned by people with disabilities in favor of new, commercially available solutions tailored to a world of mobile devices, the Internet and applications."[161/] The Commission appropriately recognized this reality in the *Real-Time Text NPRM*, which proposes to recognize RTT as a replacement technology for TTY devices on wireless phone networks beginning in December 2017 for larger carriers.[162/] Commenters in the underlying proceeding – including the Commission's Disability Advisory Committee, whose members represent a wide variety of entities with interests in disability-access issues and of which CTIA is a member – voiced unanimous support for a rulemaking to explore RTT or an alternative text technology as a replacement for TTY technology for newly deployed IP-based wireless voice devices.[163/]

CTIA urges the Commission to move forward in the pending proceeding to adopt flexible, technology-neutral rules that will best promote innovation and reflect how consumers today increasingly use innovative wireless products and services to meet their individual communications needs. CTIA and its members believe the *Real-Time Text NPRM* presents

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[161/] *See Transition for TTY to Real-Time Text Technology*, Notice of Proposed Rulemaking, CG Docket No. 16-145, FCC 16-53 (rel. Apr. 29, 2016) ("*Real-Time Text NPRM*"), at Statement of Commissioner Michael P. O'Rielly Approving in Part, Dissenting in Part.

[162/] Press Release, FCC, FCC Adopts Real-Time Text Proposed Rulemaking (Apr. 28, 2016), https://apps.fcc.gov/edocs_public/attachmatch/DOC-339100A1.pdf; *see also Real-Time Text NPRM*.

[163/] *Real-Time Text NPRM* ¶¶ 13-14.

another opportunity for the wireless industry and other stakeholders to undertake collaborative efforts to foster an accessible communications environment.

***Hearing Aid Compatibility*.** In November 2015, CTIA and other wireless industry representatives announced a consensus-based framework developed in collaboration with HLAA, the National Association of the Deaf ("NAD"), and TDI for facilitating greater access to hearing aid compatible wireless handsets for consumers who use hearing aid devices.[164/] The Consensus Proposal was the result of a collaborative process that carefully balanced the goal of HAC for all wireless handsets with the need to encourage innovations that can benefit all consumers, including those who use hearing aid devices. CTIA is pleased that the Commission thoughtfully incorporated the Consensus Proposal into the pending *Hearing Aid Compatibility NPRM*[165/] and encourages the Commission to adopt the Consensus Proposal as detailed in the filings made by the parties in its pending rulemaking proceeding. As Commissioner Ajit Pai noted, the Consensus Proposal as incorporated in the *Hearing Aid Compatibility NPRM* "seeks to ensure that our hearing aid compatibility rules keep pace with changes in technology while promoting the development of new services."[166/]

More so than proscriptive regulations, continued collaboration between the wireless industry and advocates for the accessibility community can balance the need to foster more

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[164/] *See* Letter from James Reid, Telecommunications Industry Association, Scott Bergmann, CTIA, Rebecca Murphy Thompson, Competitive Carriers Association, Anna Gilmore Hall, Hearing Loss Association of America, Claude Stout, Telecommunications for the Deaf and Hard of Hearing, and Howard A. Rosenblum, National Association of the Deaf, to Marlene H. Dortch, Secretary, FCC, WT Docket Nos. 07-250, 10-254 (filed Nov. 12, 2015) ("Consensus Proposal").

[165/] *See Improvements to Benchmarks and Related Requirements Governing Hearing Aid-Compatible Mobile Handsets; Amendment of the Commission's Rules Governing Hearing Aid-Compatible Mobile Handsets*, Fourth Report and Order and Notice of Proposed Rulemaking, 30 FCC Rcd. 13845 (2015) ("*Hearing Aid Compatibility NPRM*").

[166/] *Id*. at Statement of Commissioner Ajit Pai.

accessible wireless equipment and services with the flexibility necessary to compete and innovate in today's wireless world.

IV. CONGRESS AND THE COMMISSION CAN SUPPORT CONTINUED INNOVATION IN ACCESSIBLE WIRELESS PRODUCTS AND SERVICES BY MAKING MORE SPECTRUM AVAILABLE, APPLYING "LIGHT TOUCH" REGULATORY POLICIES, AND IMPROVING COMPLAINT PROCEDURES.

Wireless services and connectivity have become an essential part of daily life, dramatically impacting the way Americans live and work, and greatly expanding the possibilities for people with disabilities. The Commission should enable the wireless industry to continue to innovate, reduce "accessibility barriers with respect to 'new communications technologies' that are both within and outside the scope of the Act[,]"[167/] and better serve all consumers by adopting policies that make more spectrum available for commercial use, promote infrastructure deployment, and rely on a "light touch" regulatory scheme. The Commission can further help ensure that the informal RDA process functions smoothly, so that consumers, providers, and manufacturers have a common understanding and set of expectations.

Spectrum and Infrastructure Policy. As CTIA recently described to the FCC, consumers have an almost insatiable appetite for mobile wireless data services, which is increasing demand for mobile wireless spectrum to meet those needs.[168/] This demand for spectrum is already outpacing availability, and demand will only continue to grow in the coming years.[169/] To meet this demand, CTIA has supported the Commission's efforts to make available

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[167/] Public Notice ¶ 14.

[168/] *See* CTIA Wireless Competition Comments.

[169/] *See id*. at 14-15 (noting that annual data traffic grew threefold from 2013 to 2015 and that estimates show that by 2020, the average subscriber in North America will consume approximately 22 gigabytes of mobile data per month); *see also CTIA Annual Survey Report*, CTIA (May, 23 2016), http://www.ctia.org/resource-library/pressreleases/archive/americans-data-usage-more-than-doubled-in-2015.

spectrum in the 28, 37, 39, and 64-71 GHz bands ("millimeter wave spectrum") for terrestrial mobile use.[170/] The availability of millimeter wave spectrum, in addition to the adoption of broad policies that will ensure the efficient deployment of wireless infrastructure, will enable further innovation in 5G and IoT technologies. Through 5G and IoT technologies, people with disabilities will have opportunities to utilize the technologies and services with lower latency (*i.e.*, the delay in network responses), faster speeds, and higher capacity.

By adopting policies that make more spectrum available for the wireless industry – for instance, by swiftly making available the high-band spectrum required for 5G and working with NTIA to identify candidate bands in the sub-6 GHz range for repurposing for mobile broadband[171/] – the Commission will enable the wireless industry to invest and innovate to better serve the accessibility community.

The Commission can also help the wireless industry meet the needs of the accessibility community by adopting policies that ensure that the infrastructure needed to support wireless innovations can be efficiently and expeditiously deployed. This is especially true with regard to the deployment of distributed antenna system ("DAS") and small cells that will be necessary to support future 5G and IoT technologies. Efficient and effective deployment of DAS and small cells, therefore, will allow the wireless industry to better and more quickly support the accessibility community's use of wireless networks.[172/]

Light Touch Regulatory Framework. In implementing the above and other policies, the Commission should continue to use a "light touch" regulatory approach. A flexible and

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[170/] *See, e.g.*, Comments of CTIA, GN Docket No. 14-177, IB Docket No. 15-256, RM-11664, WT Docket No. 10-112, IB Docket No. 97-95 (filed Jan. 28, 2016); Reply Comments of CTIA, GN Docket No. 14-177, IB Docket No. 15-256, RM-11664, WT Docket No. 10-112, IB Docket No. 97-95 (filed Feb. 26, 2016).

[171/] *See* CTIA Wireless Competition Comments at 86-91.

[172/] *See, e.g.*, CTIA Wireless Competition Comments at 69-72.

predictable light touch regulatory framework encourages competition, innovation, and collaboration among stakeholders. If the wireless industry is to continue to offer consumers a broad range of customizable services that operate consistently across various mobile platforms – attributes that have proven immensely beneficial to persons with disabilities – then the Commission must ensure that wireless policy allows for that innovation. While CTIA's members are thoroughly invested in ensuring that all customers have access to their devices and services, they are equally concerned that accessibility requirements do not come at the expense of the innovation and creative effort that characterizes the wireless ecosystem. Congress was well aware of this important balance, and so provided industry significant flexibility to determine which products and services will be made accessible and how to achieve that flexibility.[173/]

A light touch approach to mobile wireless better enables the industry to innovate and expand the range of services available to consumers, including accessible services. For example, the free data services discussed above could be stymied by overly proscriptive Commission action or intrusive inquiry. Instead, the Commission should maintain a light touch approach in order to enable people with disabilities to realize the potential benefits of free data offerings.

Request for Dispute Assistance Process. Finally, the Commission should take small, but meaningful, steps to improve the pre-complaint RDA process for consumers and covered entities.[174/] According to CTIA's members, the RDA process has, at times, produced inconsistent and unpredictable results dependent upon how FCC staff responds to consumers raising issues outside the scope of the rules, how staff addresses resolution expectations, and the

[173/] *See, e.g.*, H. Rep. No. 111–563, at 26 (2010) (noting the potential that overburdensome requirements might "slow the pace of technological innovation").

[174/] *See* Public Notice ¶ 15 (asking "What impact, if any, has the requirement for consumers to request assistance from the Commission to resolve a dispute with a covered entity as a prerequisite to filing an informal complaint had on the development and deployment of new communications technologies that are accessible to and usable by individuals with disabilities?").

FCC's role as an impartial mediator. CTIA's member companies believe that the RDA process should be improved to ensure that RDAs are administered consistently and that consumers and covered entities have clear expectations about potential resolutions and outcomes, which, in turn, will foster greater collaborative efforts to resolve consumer concerns.

Among other things, the Commission should: (1) improve the screening process to ensure a complaint raises issues within the scope of the rules and contains sufficient information to be served on the proper entity – *i.e.*, a manufacturer versus service provider – and dismiss any portions of the RDA that fall outside of the scope the rules; (2) temper any misplaced resolution expectations by acting as impartial mediators to educate consumers about the scope of the RDA process and encouraging consumers to accept solutions that reasonably meet the original intent of the accessibility-related concern; and (3) dismiss RDA requests when a solution that is within the scope of the FCC's rules is offered or when the manufacturer or service provider provides notice that the customer did not respond to requests for engagement.

The Commission can also improve the RDA process by making guidance available that clarifies the process for both companies and consumers. In June 2015, the Government Accountability Office ("GAO") issued a report examining, among other things, the FCC's implementation of complaint and enforcement procedures mandated by the CVAA.[175/] The GAO recommended that the FCC evaluate the effectiveness of its public outreach efforts to inform the public about the accessibility-related complaint procedures by "defining objectives and establishing process and outcome metrics," and the Commission concurred with the GAO's recommendation.[176/] CTIA encourages the Commission to continue its public outreach efforts

[175/] GAO, ACCESSIBLE COMMUNICATIONS: FCC SHOULD EVALUATE THE EFFECTIVENESS OF ITS PUBLIC OUTREACH EFFORTS (June 25, 2015), http://gao.gov/products/GAO-15-574.

[176/] *Id.*

and offer publicly-available guidance about the RDA processes, consistent with the key practices identified in the GAO's report.[177/] Confirming that companies and consumers have a clear understanding of the process will lead to improved relations and cooperation, which, in turn, can lead to more accessible products and services.

CONCLUSION

Given the wireless industry's ongoing commitment to accessibility, the Commission should report to Congress that wireless service providers and manufacturers are meeting the letter, spirit, and intent of the CVAA to provide accessible advanced communications services and equipment for people with disabilities.

Respectfully submitted,

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[177/] *Id.*